

Last Name: _____ First Name _____ Network-ID _____

Writing Lab Section: _____ Writing Lab TA Name: _____

Turn off your cell phone and put it out of sight.

Calculators cannot be used.

This is a closed book exam. You have eighty (80) minutes to complete it.

1. Use a #2 pencil. Do not use a mechanical pencil or pen. Darken each circle completely, but stay within the boundary. If you decide to change an answer, erase vigorously; the scanner sometimes registers incompletely erased marks as intended answers; this can adversely affect your grade. Light marks or marks extending outside the circle may be read improperly by the scanner. Be especially careful that your mark covers the **center** of its circle.

2. **This Exam Booklet is Version A.** Mark the **A** circle in the **TEST FORM** box near the middle of your answer sheet. **DO THIS NOW!**

3. Print your **NETWORK ID** in the designated spaces at the *right* side of the answer sheet, starting in the left most column, then **mark the corresponding circle** below each character. If there is a letter "o" in your NetID, be sure to mark the "o" circle and not the circle for the digit zero. If and only if there is a hyphen "-" in your NetID, mark the hyphen circle at the bottom of the column. When you have finished marking the circles corresponding to your NetID, check particularly that you have not marked two circles in any one of the columns.

4. Print **YOUR LAST NAME** in the designated spaces at the *left* side of the answer sheet, then mark the corresponding circle below each letter. Do the same for your **FIRST NAME INITIAL**.

5. Do not write in or mark the circles in any of the other boxes (STUDENT NUMBER, DATE, SECTION, SCORES, SPECIAL CODE).

6. Sign your name (**DO NOT PRINT**) on the **STUDENT SIGNATURE line**.

7. On the **SECTION line**, print your **Writing Lab Section**. You need not fill in the **COURSE** or **INSTRUCTOR** lines.

Before starting work, check to make sure that your test booklet is complete. You should have 19 numbered pages..

Academic Integrity—Giving assistance to or receiving assistance from another student or using unauthorized materials during a University Examination can be grounds for disciplinary action, up to and including dismissal from the University.

Exam Grading Policy—

The exam consists of 75 questions, worth a total of **363** points, composed of 4 types of questions.

Rules for partial credit

Note: there will be no partial credit for problems with multiple correct answers. These problems are marked and all correct answers need to be marked correctly on the answer sheet in order to obtain credit.

MC5: *multiple-choice-five-answer questions, each worth 6 points.*

Partial credit will be granted as follows.

- (a) If you mark only one answer and it is the correct answer, you earn **6** points.
- (b) If you mark *two* answers, one of which is the correct answer, you earn **3** points.
- (c) If you mark *three* answers, one of which is the correct answer, you earn **2** points.
- (d) If you mark no answers or the wrong answer, or more than *three*, you earn **0** points.

MC4: *multiple-choice-four-answer questions, each worth 4 points.*

Partial credit will be granted as follows.

- (a) If you mark only one answer and it is the correct answer, you earn **4** points.
- (b) If you mark *two* answers, one of which is the correct answer, you earn **2** points.
- (c) If you mark a wrong answer or no answers or more than two, you earn **0** points.

MC3: *multiple-choice-three-answer questions, each worth 3 points.*

No partial credit.

- (a) If you mark only one answer and it is the correct answer, you earn **3** points.
- (b) If you mark a wrong answer or no answers, you earn **0** points.

MC2: *multiple-choice-two-answer questions, each worth 2 points.*

No partial credit.

- (a) If you mark only one answer and it is the correct answer, you earn **2** points.
- (b) If you mark the wrong answer or neither answer, you earn **0** points

A. Nuclear Physics

Definitions. The following table will be used for questions 1-6. The table lists 6 terms that need to be defined. Each row in the table corresponds to one question, 1-6. The 1st column lists for each questions the term to be defined. The 2nd column contains different possible definitions and an answer key for each question, A-E and AB. On your answer sheet bubble for each question the matching answer key from the 2nd column. The key “AB” requires to bubble both answers A and B. **[2 points each]**

Term	Definition
1) Nucleons	A. Protons and neutrons
2) Protons	B. Number of protons in a nucleus
3) Atomic Number	C. Nucleus + electrons
4) Neutrons	D. Nuclear particles with positive charge
5) Atomic Weight	E. Number of protons and neutrons in a nucleus
6) Atom	AB. Nuclear particles with no charge

7) Nuclear Binding Energies compared to chemical binding energies are larger by a factor of

- A. 10
- B. 100
- C. 1,000
- D. 100,000
- E. 1,000,000

8) What isotope of uranium is most common in nature?

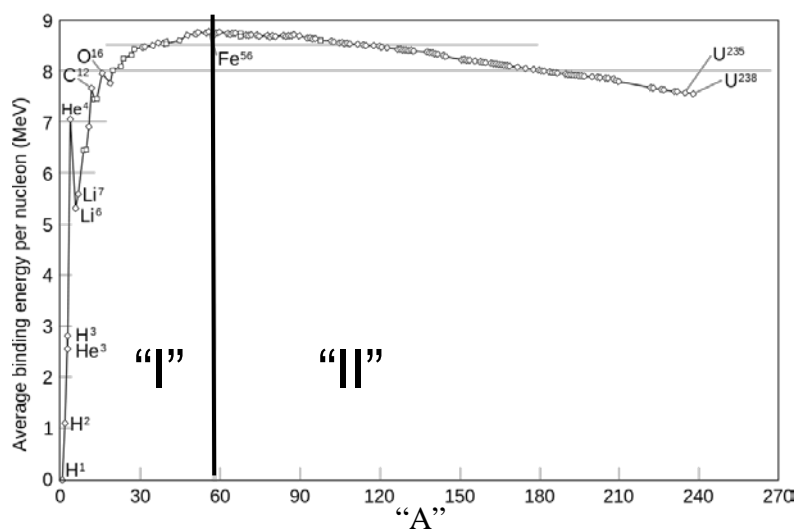
- A. U-235
- B. U-238
- C. U-232
- D. U-234

9) What is the distinguishing feature of two isotopes of the same element?

- A. Mass number
- B. Number of protons
- C. Number of electrons

- 10) The nuclide ${}^{238}_{92}\text{U}$ has...
- 238 neutrons and 92 protons
 - 92 neutrons 146 protons
 - 92 neutrons and 238 protons
 - 146 neutrons and 92 protons
- 11) Which of the following statements is correct?
- U-235 can capture a neutron, a proton, or an electron to induce nuclear fission; scientists focus on neutrons because they are the heaviest.
 - U-238 can capture only a neutron to induce nuclear fission because neutrons are the only elementary particles that exist naturally outside a nuclide.
 - Pu-239 can capture either a neutron or a proton to induce nuclear fission since the only noticeable difference between the two particles is their mass.
 - Pu-239 undergoes nuclear fission from the capture of a neutron not a proton, as the positive electric charge of nucleus would repel the proton.

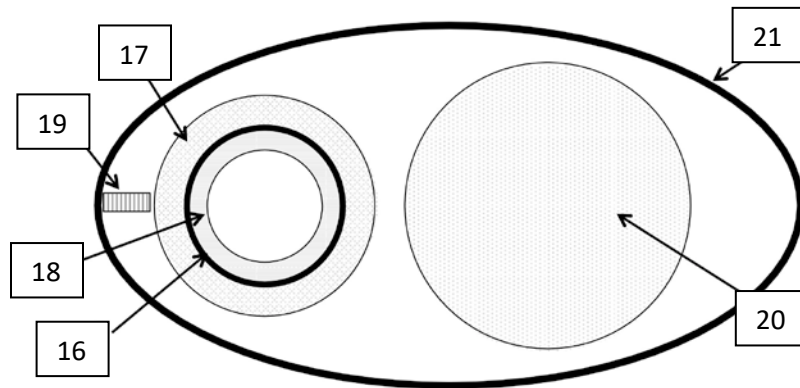
Use the graph of binding energies to answer questions 12-14.



- 12) Order the elements U, Fe, Li and H according to their binding energy per nucleon (largest binding energy first):
- U, Fe, Li, H
 - H, Li, Fe, U
 - Fe, U, Li, H
 - U, Fe, H, Li
- 13) The region of binding energy graph where fusion can occur is...
- region "I" at small values of A
 - region "II" at large values of A
 - regions "I" and "II"
 - binding energy is not related to fusion
- 14) The heaviest element that can be produced through fusion reactions in stars is Uranium
- True
 - False

B. Nuclear weapons

Use the diagram of the thermonuclear bomb to answer questions 15-21.



15) What device does the above diagram depict?

- A. Thermonuclear Weapon
- B. Implosion Weapon
- C. Gun-Type Weapon
- D. Plasma Depth Charge

Questions 16-21 Match the weapon components identified by numbers in the figure above, 16-21, with the correct answer keys, A-E and AB, provided in the list below. The key "AB" requires to bubble both answers A and B. [2 points each]

- A. Neutron-emitting initiator
- B. High-explosive lens assembly
- C. Tamper/reflector
- D. Hollow "pit"
- E. DU (depleted uranium) shell
- AB. Fusion packet

22) What is the theoretical maximum yield of a thermonuclear weapon?

- A. 100 kiloton
- B. 1 Megaton
- C. 100 Megatons
- D. None exists

- 23) Uranium enriched to ____ or more U-235 can be used to produce a nuclear explosion.
- A. 10%
 - B. 20%
 - C. 40%
 - D. 80%
- 24) Which statement most accurately describes how a supercritical assembly is formed in a gun-type weapon?
- A. A HEU bullet is fired into a hollow HEU cylinder
 - B. Two cylindrical HEU bullets are simultaneously fired at one another
 - C. A hollow HEU cylinder is fired onto a HEU target
 - D. A HEU sphere is compressed using conventional explosives
- 25) The most common uranium enrichment method is based on which property concerning U-235 and U-238?
- A. Charge
 - B. Radioactivity
 - C. Electron structure
 - D. Mass
- 26) Why do gun-type weapons use U-235 as fissile material?
- A. U-235 has a slow rate of spontaneous fission and decay
 - B. U-235 is easier to obtain than Pu-239
 - C. Conventional explosives are only compatible with U-235
 - D. The critical mass for U-235 is smaller than that of Pu-239
- 27) What kind of radioactive material can be used in a “dirty bomb”?
- A. Only fissile material
 - B. Any nuclear explosive material
 - C. Any material that undergoes radioactive decay
 - D. Any fissionable nuclide
- 28) What role does the bomb casing play if it is made of uranium?
- A. Start the fission reaction in the primary
 - B. Contribute additional energy to the yield *via* fission reactions
 - C. Add generations to the fission chain reaction
 - D. Initiate the fusion reaction in the secondary

C. Current events and reading assignments

- 29) According to "The Hidden Travels of the Bomb", why have so few nations developed nuclear weapons?
- A. Mastering the technology to design and build a bomb is prohibitively difficult.
 - B. Very few states ever considered nuclear weapons to be a useful addition to their military arsenal.
 - C. No states have been able to develop the sufficient technology for enrichment, production, and weapon design without help from another state that already had nuclear weapons.
 - D. No nuclear states were willing to divulge information about their nuclear programs, so each potential nuclear state had to work through the science of enrichment, production, and weapon design on their own.
- 30) The Non-Proliferation Treaty (NPT) recognizes as legitimate the nuclear arsenals of the following states [**select all that apply**]:
- A. France
 - B. India
 - C. China
 - D. Israel
 - E. Russia
- 31) *The Day After Midnight* discusses the casualties and economic damage that would likely result from different types of attacks in a confrontation between the United States and the Soviet Union. Regardless of the scenario, which pattern did the authors expect to see?
- A. The Soviet Union would suffer more economic damage but a lower number of casualties.
 - B. The Soviet Union would suffer less economic damage and a lower number of casualties.
 - C. The Soviet Union would suffer more economic damage and a higher number of casualties.
 - D. The Soviet Union would suffer less economic damage but a higher number of casualties.
- 32) A 2014 report detailed a cheating scandal among military officers tasked with launching nuclear weapons in the event of an authorized strike. What was the main reason cited for the incident?
- A. These assignments are highly competitive and sought after.
 - B. The event was symptomatic of a general culture of dishonesty in the US military in relation to promotion.
 - C. Military personnel see these jobs as lacking in both prestige and chances for career advancement.
 - D. This was a misunderstanding about test protocol.

- 33) Why did the Britain's June 2016 Trident missile test fail?
- A. Incorrect telemetry (guidance) information
 - B. This was an untested version of the Trident system
 - C. The weapon was loaded with an improper payload
 - D. The third-stage motor failed to ignite.
- 34) In relation to the previous question, why does Britain test its ballistic missiles so infrequently? **[Mark all that apply]**
- A. US and British Trident missiles share the same underlying technology, so it is not vital that both countries test them frequently.
 - B. Britain tests Trident missiles in response to clear actions by other countries that merit an aggressive display.
 - C. Britain's Royal Navy has a much stricter budget than the US military.
 - D. Pressure from other EU countries stops Britain from testing more frequently.
- 35) Among other factors, which of the following was noted in the recent New York Times piece as a key to General McMaster's success as a commander in Iraq?
- A. He greatly increased the frequency of night patrols, which resulted in decreased insurgent activity in key areas.
 - B. He pushed for improvements in equipment provision for his troops.
 - C. He insisted that his troops prioritize civilian safety over detaining or killing insurgents.
 - D. He worked more closely with coalition troops from other nations than previous commanders had.
- 36) After North Korea's recent launch of four missiles, the US began the deployment of the Terminal High-Altitude Area Defense (THAAD) system in South Korea. What is the most likely reason China opposes the deployment of this system?
- A. THAAD could shoot down China's own missiles should they launch an attack against any target.
 - B. THAAD uses a particular radar unit which could be used to monitor China's missile testing.
 - C. China sides with North Korea in this dispute and opposes any system that threatens North Korea's nuclear capabilities.
 - D. THAAD introduces a radar unit which, in conjunction with existing radar units in Japan, could help US defense systems identify and neutralize inbound Chinese missiles.

- 37) According to Bill Gates, bioterrorism may be a greater threat than nuclear war. Why?
- A. Defense systems can neutralize almost all nuclear weapons in the event of an attack.
 - B. Government agencies do not coordinate with other agencies or vaccine companies in order to prepare for such an attack.
 - C. Several terrorist organizations are known to already possess large stockpiles of biological agents that could be used in an attack.
 - D. Disaffected scientists in Russia and Pakistan recently sold large quantities of these biological agents to terrorist groups.
- 38) Which of the following was **not** an accomplishment of the Megatons to Megawatts program?
- A. Reduced the threat of atomic terrorism
 - B. Helped stabilize the economy of the former Soviet Union
 - C. Provided 30 percent of US energy for approximately 20 years
 - D. Played a key role in nuclear disarmament
- 39) Analysts studied a photo of North Korea's unveiling of a new nuclear device and came to several conclusions. Which of the following conclusions did analysts make concerning the composition of the crowd around Kim Jong-un?
- A. The presence of so many military leaders in full uniform was meant to show solidarity among the various branches.
 - B. The lack of other individuals in the photo besides Kim was meant to show his unique contribution to the effort.
 - C. The decision to have military leaders attend in civilian clothing was meant to highlight North Korea's rule by a single person - not the military establishment.
 - D. The presence of only young military officers was meant to signal a move away from the prior leadership.

D. Nuclear weapon delivery methods

- 40) The Chinese Silkworm cruise missile has a range of 180 miles. What does this range suggest?
- A. The Chinese have not succeeded of designing an accurate weapon with a longer range.
 - B. The Chinese perceive an enemy navy as a significant threat and this range is sufficient to destroy an enemy carrier group.
 - C. Designed after the Sino-Soviet Split, 180 miles is the distance between the silos in Altay, China and the Soviet Severnaya Satellite Station.
 - D. Chinese nuclear weapons are too heavy and limit the range of all Chinese missiles.

- 41) What is the primary difference between a hot and cold launch for a missile?
- A. A hot launch refers to procedures used to launch missiles in warm climates like Guam, whereas cold launches are used for Alaskan silos.
 - B. A hot launch occurs from a moving vehicle like an airplane or submarine, while a cold launch occurs from a stationary location like a silo.
 - C. A hot launch requires rocket engines to start within a silo, while a cold launch is initiated by a high-pressure ejection, and then activation of engines.
 - D. A hot launch is initiated by a high-pressure ejection, and then activation of engines, while a cold launch requires rocket engines to start within a silo.
- 42) Why did Pakistan seek to increase the range of its missiles to 1300km?
- A. To achieve nuclear parity with Russia
 - B. To deliver their large supply of plutonium nuclear weapons
 - C. To be able to effectively strike major cities in India
 - D. To supplement its sizeable arsenal of ICBMs
- 43) While some countries still use liquid fuel, recent US missile designs use solid fuel because:
- A. A common chemical in liquid fuel, methyl tert-butyl ether (MTBE) was banned by the EPA.
 - B. Liquid fuel is volatile and has a high potential to explode, leading it to be stored separately from the missile itself.
 - C. Many liquid fuels use technetium-99, a radioactive liquid, to prevent freezing in cold climates.
- 44) Assume an American spy has learned that North Korea has been designing highly-accurate GPS systems and attempting to find digital maps of South Korean cities. Why would this be significant?
- A. North Korean cruise missiles could use GPS positioning to make corrections mid-flight to move over terrain and to hit targets more accurately.
 - B. GPS systems could be used to pilot missiles out of the way of incoming anti-missile weapons.
 - C. GPS systems are required for any missile which exits and then re-enters the atmosphere.
- 45) This Soviet missile design, based on the German V2, is the basis for many other nation's missiles.
- A. "November Rain" / N-12
 - B. "Scud" / R-11
 - C. "Big Ivan" / BM-2
 - D. "Hammer" / USSR-2

- 46) Which of these comparisons between cruise missiles and ballistic missiles is accurate?
- A. Cruise missiles are exo-atmospheric, whereas ballistic missiles are endo-atmospheric.
 - B. Cruise missiles cannot be deployed on submarines, whereas ballistic missiles can be.
 - C. Cruise missiles can be deployed on submarines, whereas ballistic missiles cannot be.
 - D. Cruise missiles are endo-atmospheric, whereas ballistic missiles are exo-atmospheric.
 - E. Cruise missiles cannot carry nuclear weapons, whereas ballistic missiles can.
- 47) What is the main benefit of using bomber aircraft to deliver nuclear weapons?
- A. Bombers are the only nuclear weapon delivery system that can be recalled.
 - B. Bombers are less expensive than ICBMs, allowing more to be produced.
 - C. Bombers can penetrate deeper into enemy territory than a ballistic missile without being detected or intercepted.
 - D. Bombers are dual-purpose and can be used in conventional warfare.
- 48) Which of these guidance systems is **not** used in cruise missiles?
- A. Terrain Contour Matching
 - B. Digital Scene Matching Area Correlation
 - C. Global Positioning System (GPS)
 - D. Passive Acoustic Monitoring (PAM)
 - E. Terminal Guidance System
- 49) The Special Atomic Demolition Munition is a small (less than 1kt), man-portable nuclear device designed to be used by US Army engineers in the event of a Soviet invasion of Europe. In this scenario, which of these would be effective uses of this delivery system?
[Select all that apply]
- A. Knocking out strategic choke points such as bridges or tunnels to slow the Soviet advance.
 - B. Destroying Soviet cities as part of a nuclear retaliation by NATO.
 - C. Destroying power plants as part of a scorched-earth policy.
 - D. Battlefield use in support of troops against superior conventional forces.
- 50) Which of these platforms can a cruise missile **not** be launched from?
- A. Surface ships
 - B. Submarines
 - C. Bomber aircraft
 - D. Ground-based sites
 - E. A cruise missile can be launched from all of the above platforms.

E. Nuclear Explosions

51) A nuclear attack on a country would lift soot into the atmosphere, screening the sunlight and reducing surface temperatures on Earth. How long would it take for half of the soot to fall out of the atmosphere?

- A. 1 month
- B. 1 year
- C. 5 years
- D. 10 years

52) Deep underground nuclear tests can be detected through the monitoring of:

[mark all correct answers]

- A. The release of radioactive noble gases
- B. Irregular seismic activity
- C. The development of cracks in the Earth's surface
- D. Deep underground nuclear tests cannot be detected
- E. Detection of low frequency acoustic signals

53) In which of the following test environments did the United States discover the effects of the EMP (Electromagnetic Pulse) following a nuclear explosion?

- A. Explosions underground
- B. Explosions at high altitudes
- C. Underwater bursts
- D. Air and surface bursts

54) Which of the following statements are correct for a 100 kT explosion.

[mark all correct answers]

- A. Surface burst produces greater fallout than an airburst
- B. The fireball touches the ground unless HOB > 3000ft
- C. For underground bursts, seismic waves caused by the explosion can be detected even at large distances
- D. If tested at a sufficient depth, an underground nuclear weapon test can be carried out undetected
- E. For a fully contained (no venting) underground nuclear explosion, no radioactivity (except noble gases) is released

55) What is the expected change in global surface temperatures that would be produced if the weapons in the current strategic arsenals of the U.S and Russia were exploded?

- A. -9 to -7 C
- B. -3 to -4 C
- C. -2 to 0 C
- D. 0 to +2 C
- E. +3 to +4 C

F. Terrorism and its characteristics

- 56) Which is not one of the three factors that Richardson argues leads to terrorism?
- A. A disaffected individual
 - B. An enabling community
 - C. Extreme wealth disparity
 - D. A legitimizing ideology
- 57) Which is not one of the three immediate objectives (the “3 Rs”) that Richardson argues terrorists seek?
- A. Revenge
 - B. Renown
 - C. Reaction
 - D. Response
- 58) Which is a defining characteristic of terrorism?
- A. The violence must have a political purpose
 - B. The violence must be religiously based
 - C. The individual victims must be randomly chosen
 - D. The violence is targeted at governmental officials and/or structures
- 59) Which is not one of the four categories of violent political activity?
- A. Terrorism
 - B. Insurgency
 - C. Guerilla warfare
 - D. Militias
- 60) What type of nuclear weapon would be most probable for a terrorist organization to construct?
- A. Levitated-pit implosion
 - B. Implosion
 - C. Gun type
 - D. Two-point hollow-pit implosion
- 61) Terrorism is deliberately and violently targeting ___ for ___ purposes
- A. Government officials; Religious
 - B. Civilians; Political
 - C. Government officials; Political
 - D. Civilians; Religious
- 62) Which of these are categories of terrorism?
- A. State-sponsored terrorism
 - B. State terrorism
 - C. War terrorism
 - D. All of the above

- 63) Which is not a historical example of state terrorism?
- A. Germany in the 1930s
 - B. US support of terrorist groups in Angola and Nicaragua
 - C. Argentina in the 1970s
 - D. Iraq in the 1980s and 1990s
- 64) What does Richardson argue was a mistake made by the United States after the terrorist attack on September 11th, 2001?
- A. Invading Iraq in 2003
 - B. Not providing enough media coverage of the attack
 - C. Declaring a global war on terror
 - D. Not creating stronger alliances in the Middle East
- 65) What are the approaches that Richardson mentions as a way reduce the threat of nuclear terrorism?
- A. Invasion and war
 - B. Cooperative efforts to secure or intercept nuclear explosive materials
 - C. Both A and B
 - D. None of the above
- 66) A terrorist organization is most likely to obtain a nuclear weapon by stealing it
- A. True
 - B. False
- 67) Which group of materials listed below all contain naturally radioactive isotopes that can cause a radiological false alarm in the portal monitors on the border?
- A. Bananas, hand soap, cell phones
 - B. Glass, ceramics, fabric
 - C. Hand soap, cell phones, glass
 - D. Kitty litter, ceramics, bananas
- 68) Which of the following is *not* a reason that an implosion-type bomb would present more technical challenges than other types?
- A. Difficulty in acquiring LEU
 - B. Difficulty in designing high explosive lenses
 - C. Difficulty in machining and assembling precision parts
 - D. Difficulty in triggering the implosion

G. Nuclear materials

69. Identify the most common fissile isotopes used for making fission weapons

[mark all correct answers]

- A. U-235
- B. U-238
- C. Pu-239
- D. Pu-240
- E. Pu-238

Questions 70 - 72 are related to the picture and description below

In 1994 the briefcase pictured to the left was confiscated at the Munich airport. Inside, security personnel found 560g of plutonium and uranium, as well as 210g of lithium metal which contained 89.4% Lithium-6.



70. Without any additional information which of the following answer describes best which weapon(s) would be possible to make from the material in the briefcase?

- A. A plutonium nuclear fission weapon
- B. A uranium nuclear fission weapon
- C. A thermonuclear weapon
- D. A radiological (dirty) bomb
- E. All four, a plutonium nuclear fission weapon, uranium nuclear fission weapon, a thermonuclear weapon, and a radiological bomb.

71. Now one learns that the plutonium was reactor grade plutonium whereas the uranium comes from a research reactor using HEU. Which of the following weapons designs would be the easiest to make starting from the smuggled nuclear-explosive material?

- A. An implosion type plutonium nuclear fission weapon
- B. An implosion type uranium nuclear fission weapon
- C. A gun type plutonium nuclear fission weapon
- D. A gun type uranium nuclear fission weapon
- E. A thermonuclear weapon

72. What would be the **most likely** purpose of the lithium metal in a nuclear weapon?
- A. The Li-6 used as an initiator of an implosion type nuclear fission weapon
 - B. The lithium metal used as a reflector for an implosion type nuclear weapon to reduce the number of neutrons that escape a configuration of fissile material
 - C. The Li-6 combined with deuterium used as the fusion packet inside a thermonuclear weapon
 - D. The lithium metal used as the breeder of triton in a gun type nuclear fission weapon
 - E. The Li-6 used as an impurity in the hollow shell (“pit”) of a thermonuclear weapon
73. Which would influence the amount of nuclear explosive material needed to assemble a critical mass? [**mark all correct answers**]
- A. Density of the NEM
 - B. Purity of nuclear explosive isotope in the NEM
 - C. Presence of a neutron reflector surrounding the NEM
 - D. Geometry of the NEM
74. What neutron multiplication factor (R) is required for the nuclear material configuration to be considered critical?
- A. $R < 0$
 - B. $R = 0$
 - C. $0 < R < 1$
 - D. $R = 1$
 - E. $R > 1$

H. Essay Question – 45 points of 363 (Limit Answer to one page on the next sheet)

75. Assume a truck transporting a highly radioactive cobalt-60 source to a cancer clinic has been attacked and the radioactive source was stolen. The theft as occurred just days from the start of a NATO summit in a nearby major city.
- a. Analyze the potential threat resulting from this theft to the summit: can the isotope stolen be used to build a weapon to attack the summit given the time frame? If an attack would occur, what would be the impact on the summit, the city and its citizens?
 - b. Given the vast size of the metropolitan area, describe a strategy to search for the stolen source and searching for members of the group that have carried out the theft and may be preparing to attack the summit.
 - c. Given the nature of the threat propose a security plan that could protect the summit successfully. Will it be possible to guarantee security both for the summit and the wider metropolitan area?

Written Answer to question 75 – limit hand written answer to space on this page and the next page. Note it is important to write your name and writing lab – this page will be separated from the exam for grading:

Name:

Your Writing Lab:

**Check to make sure you bubbled in all your answers.
Did you bubble in your name, exam version and network-ID?**

Name:

Your Writing Lab:

**Check to make sure you bubbled in all your answers.
Did you bubble in your name, exam version and network-ID?**